

Chapter 5

Write a Perl Client Application

Juniper Networks provides a Perl module, called JUNOS::Device, to help you more quickly and easily develop custom Perl scripts for configuring and monitoring routers. The module implements an object that client applications can use to communicate with the JUNOScript server on a router. Accompanying the JUNOS::Device module are several sample Perl scripts, which illustrate how to use the module in scripts that perform various functions.

This chapter discusses the following topics:

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Download the Module and Sample Scripts

To download, uncompress, and unpack the compressed tar-format file that contains the JUNOS::Device module and sample scripts, perform the following steps:

1. Access the Juniper Networks Customer Support Center Web page at <http://www.juniper.net/support>.
2. Click on the link labeled “JUNOScript API Software.”
3. For installation instructions, click on the link to the README.html file in the “JUNOScript Perl Module and Sample Scripts” section, and see the “Installation” section of the README.html file.

Module and Sample Scripts

The JUNOScript Perl distribution uses the directory structure for Perl modules that is used by the Comprehensive Perl Archive Network (<http://www.cpan.org>). There is a lib directory for the JUNOS::Device module and its supporting files, and an examples directory for the sample scripts.

The JUNOS::Device Perl module implements an object that client applications can use to communicate with a JUNOScript server; all the sample scripts use it.

- The sample scripts illustrate how to perform the following functions:
 - `diagnose_bgp.pl`—Illustrates how to write scripts to monitor router status and diagnose problems. The sample script extracts and displays information about a router's unestablished Border Gateway Protocol (BGP) peers from the full set of BGP configuration data.
 - `get_chassis_inventory.pl`—Illustrates how to use one of the predefined Perl JUNOScript queries to request information from a router. The sample script invokes the `get_chassis_inventory` query, which requests the same information as the `<get-chassis-inventory>` JUNOScript tag and the JUNOS command-line interface (CLI) `show chassis hardware` command. For a list of all Perl queries available in this release of JUNOScript, see Table 6.
 - `load_configuration.pl`—Illustrates how to change the router configuration by loading a file of configuration data that is formatted with JUNOScript tags. The distribution includes two sample files, `set_login_user_foo.xml` and `set_login_class_bar.xml`, but you can specify another JUNOScript configuration file on the command line.
- The following sample scripts are used together to illustrate how to store and retrieve JUNOScript (or any Extensible Markup Language [XML]) data in a relational database. The scripts create and manipulate MySQL tables, but illustrate data manipulation techniques that apply to any relational database:
 - `get_config.pl`—Illustrates how to retrieve router configuration information.
 - `make_tables.pl`—Generates a set of Structure Query Language (SQL) statements for creating relational database tables and inserting data extracted from a specified XML file.
 - `pop_tables.pl`—Populates existing relational database tables with data extracted from a specified XML file.
 - `unpop_tables.pl`—Transforms data stored in a relational database table into XML and writes it to a file.
- For instructions on running the scripts, see the `README` or `README.html` file included in the JUNOScript Perl distribution.

Request and Load Configuration Data

The `get_config.pl` script described in “Module and Sample Scripts” on page 71 illustrates how to request JUNOScript configuration data. The `load_configuration.pl` script illustrates how to load configuration data, and includes logic for handling and recovering from errors. They are appropriate bases for custom scripts that perform these functions.

Mapping of Perl Queries to JUNOScript Tags

The sample scripts described in “Module and Sample Scripts” on page 71 invoke only a small number of the predefined JUNOScript Perl queries that client applications can use. Table 6 maps all the Perl queries available in the current version of JUNOScript to the corresponding JUNOScript response tag and JUNOS CLI command. Each query has the same name as the corresponding JUNOScript request tag (to derive the request tag name, replace each underscore with a hyphen and enclose the string in angle brackets).

For more information about JUNOScript request and response tags, see the *JUNOScript API Reference*.

Table 6: Mapping of Perl Queries to Response Tags and CLI Commands

Perl Query	JUNOScript Response Tag	CLI Command
clear_helper_statistics_information	NONE	clear helper statistics
clear_ipv6_nd_information	<ipv6-modify-nd>	clear ipv6 neighbors
file_compare	NONE	file compare
file_copy	NONE	file copy
file_delete	NONE	file delete
file_list	NONE	file list
file_rename	NONE	file rename
file_show	NONE	file show
get_accounting_profile_information	<accounting-profile-information>	show accounting
get_accounting_record_information	<accounting-record-information>	show accounting records
get_alarm_information	<alarm-information>	show chassis alarms
get_bgp_group_information	<bgp-group-information>	show bgp group
get_bgp_neighbor_information	<bgp-information>	show bgp neighbor
get_bgp_summary_information	<bgp-information>	show bgp summary
get_chassis_inventory	<chassis-inventory>	show chassis hardware
get_cos_classifier_information	<cos-classifier-information>	show class-of-service classifier
get_cos_classifier_table_information	<cos-classifier-table-information>	show class-of-service forwarding-table classifier
get_cos_classifier_table_map_information	<cos-classifier-table-map-information>	show class-of-service forwarding-table classifier mapping
get_cos_code_point_map_information	<cos-code-point-map-information>	show class-of-service code-point-aliases
get_cos_drop_profile_information	<cos-drop-profile-information>	show class-of-service drop-profile
get_cos_forwarding_class_information	<cos-forwarding-class-information>	show class-of-service forwarding-class
get_cos_information	<cos-information>	show class-of-service
get_cos_interface_map_information	<cos-interface-information>	show class-of-service interface
get_cos_red_information	<cos-red-information>	show class-of-service forwarding-table drop-profile
get_cos_rewrite_information	<cos-rewrite-information>	show class-of-service rewrite-rule
get_cos_rewrite_table_information	<cos-rewrite-table-information>	show class-of-service forwarding-table rewrite-rule
get_cos_rewrite_table_map_information	<cos-rewrite-table-map-information>	show class-of-service forwarding-table rewrite-rule mapping
get_cos_scheduler_map_information	<cos-scheduler-map-information>	show class-of-service scheduler-map
get_cos_scheduler_map_table_information	<cos-scheduler-map-table-information>	show class-of-service forwarding-table scheduler-map
get_cos_table_information	<cos-table-information>	show class-of-service forwarding-table
get_destination_class_statistics	<destination-class-statistics>	show interfaces destination-class
get_environment_information	<environment-information>	show chassis environment

Perl Query	JUNOScript Response Tag	CLI Command
get_fabric_queue_information	<fabric-queue-information>	show class-of-service fabric queue
get_feb_information	<scb-information>	show chassis feb
get_firewall_information	<firewall-information>	show firewall
get_firewall_log_information	<firewall-log-information>	show firewall log
get_firmware_information	<firmware-information>	show chassis firmware
get_forwarding_table_information	<forwarding-table-information>	show route forwarding-table
get_fpc_information	<fpc-information>	show chassis fpc
get_helper_statistics_information	<helper-statistics-information>	show helper statistics
get_ike_security_associations_information	<ike-security-associations-information>	show ike security-associations
get_instance_information	<instance-information>	show route instance detail
get_instance_summary_information	<instance-information>	show route instance
get_interface_filter_information	<interface-filter-information>	show interfaces filters
get_interface_information	<interface-information>	show interfaces
get_interface_policer_information	<interface-policer-information>	show interfaces policers
get_interface_queue_information	<interface-queue-information>	show interfaces queue
get_ipv6_nd_information	<ipv6-nd-information>	show ipv6 neighbors
get_ipv6_ra_information	<ipv6-ra-information>	show ipv6 router-advertisement
get_isis_adjacency_information	<isis-adjacency-information>	show isis adjacency
get_isis_database_information	<isis-database-information>	show isis database
get_isis_hostname_information	<isis-hostname-information>	show isis hostname
get_isis_interface_information	<isis-interface-information>	show isis interface
get_isis_route_information	<isis-route-information>	show isis route
get_isis_spf_information	<isis-spf-information>	show isis spf
get_isis_statistics_information	<isis-statistics-information>	show isis statistics
get_l2ckt_connection_information	<l2ckt-connection-information>	show l2circuit connections
get_l2vpn_connection_information	<l2vpn-connection-information>	show l2vpn connections
get_ldp_database_information	<ldp-database-information>	show ldp database
get_ldp_interface_information	<ldp-interface-information>	show ldp interface
get_ldp_neighbor_information	<ldp-neighbor-information>	show ldp neighbor
get_ldp_path_information	<ldp-path-information>	show ldp path
get_ldp_route_information	<ldp-route-information>	show ldp route
get_ldp_session_information	<ldp-session-information>	show ldp session
get_ldp_statistics_information	<ldp-statistics-information>	show ldp statistics
get_ldp_traffic_statistics_information	<ldp-traffic-statistics-information>	show ldp traffic-statistics
get_ldp_information	<ldp-information>	show ldp
get_lm_information	<lm-information>	show link-management
get_lm_peer_information	<lm-peer-information>	show link-management peer
get_lm_routing_information	<lm-routing-information>	show link-management routing
get_lm_routing_peer_information	<lm-peer-information>	show link-management routing peer
get_lm_routing_te_link_information	<lm-te-link-information>	show link-management routing te-link
get_lm_te_link_information	<lm-te-link-information>	show link-management te-link
get_mpls_admin_group_information	<mpls-admin-group-information>	show mpls admin-groups
get_mpls_cspf_information	<mpls-cspf-information>	show mpls cspf

Perl Query	JUNOScript Response Tag	CLI Command
get_mpls_interface_information	<mpls-interface-information>	show mpls interface
get_mpls_lsp_information	<mpls-lsp-information>	show mpls lsp
get_mpls_path_information	<mpls-path-information>	show mpls path
get_ospf_database_information	<ospf-database-information>	show ospf database
get_ospf_interface_information	<ospf-interface-information>	show ospf interface
get_ospf_io_statistics_information	<ospf-io-statistics-information>	show ospf io-statistics
get_ospf_log_information	<ospf-log-information>	show ospf log
get_ospf_neighbor_information	<ospf-neighbor-information>	show ospf neighbor
get_ospf_route_information	<ospf-route-information>	show ospf route
get_ospf_statistics_information	<ospf-statistics-information>	show ospf statistics
get_pic_information	<fpc-information>	show chassis fpc pic-status
get_rmon_alarm_information	<rmon-alarm-information>	show snmp rmon alarms
get_rmon_event_information	<rmon-event-information>	show snmp rmon events
get_rmon_information	<rmon-information>	show snmp rmon
get_route_engine_information	<route-engine-information>	show chassis routing-engine
get_route_information	<route-information>	show route
get_route_summary_information	<route-summary-information>	show route summary
get_rsvp_interface_information	<rsvp-interface-information>	show rsvp interface
get_rsvp_neighbor_information	<rsvp-neighbor-information>	show rsvp neighbor
get_rsvp_session_information	<rsvp-session-information>	show rsvp session
get_rsvp_statistics_information	<rsvp-statistics-information>	show rsvp statistics
get_rsvp_version_information	<rsvp-version-information>	show rsvp version
get_rtexport_instance_information	<rtexport-instance-information>	show route export instance
get_rtexport_table_information	<rtexport-table-information>	show route export
get_rtexport_target_information	<rtexport-target-information>	show route export vrf-target
get_scb_information	<scb-information>	show chassis scb
get_security_associations_information	<security-associations-information>	show ipsec security-associations
get_sfm_information	<scb-information>	show chassis sfm
get_snmp_information	<snmp-statistics>	show snmp statistics
get_source_class_statistics	<source-class-statistics>	show interfaces source-class
get_spmb_information	<spmb-information>	show chassis spmb
get_spmb_sib_information	<spmb-sib-information>	show chassis spmb sibs
get(ssb)_information	<scb-information>	show chassis ssb
get_syslog_tag_information	<syslog-tag-information>	help syslog
get_ted_database_information	<ted-database-information>	show ted database
get_ted_link_information	<ted-link-information>	show ted link
get_ted_protocol_information	<ted-protocol-information>	show ted protocol
request_halt	NONE	request system halt
request_package_add	NONE	request system software add
request_package_delete	NONE	request system software delete
request_package_validate	NONE	request system software validate
request_reboot	NONE	request system reboot

